UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
ALLIED BANK TOWER AT FOUNTAIN PLACE
1445 ROSS AVENUE
DALLAS, TEXAS 75202

NOV 23 7:20
SUPERFUND BRANCH

NOV 20 1987

REPLY TO: 6T-AS

MEMORANDUM

SUBJECT: Background Concentrations of Volatile Organic Compounds near the North Calvalcade Superfund Site, Houston, Texas

FROM: Ragan Broyles
Chief
State Program Section (6T-AS)

TO: Larry Wright
Chief
Enforcement Section (6H-EE)

005379

The Air Division has received a request from Jim Pendergast, Regional Project Manager for the North Calvalcade Superfund site, for background concentrations of volatile organic compounds (VOC'S) in Houston, Texas. A composite number for VOC concentration is not available because monitoring for such data is not currently being conducted in Harris County. Our search however, did find results from two studies which monitor for specific organic compounds near North Calvacade and should provide some information on the general air quality around the site.

The two studies, Gulf Coast Community Exposure Study (GCCES) and Toxic Air Monitoring System (TAMS), have monitors located near the North Calvalcade site. The Gulf Coast Community Exposure study "Cloverleaf 2" monitor is located north of Interstate 10 at the intersection of Frank Blvd and Greenville Street. Table 1 shows the measured concentrations of crysene, pyrene, benzo-a-pyrene, benzene and benzo(ghi)perylene at the Cloverleaf 2 monitoring station from January 1, 1986 to September 16, 1986. The data show benzene to be the compound measured in consistantly appreciable concentrations. In addition to the compounds listed above, the following compounds and elements were monitored for, but not detected: arsenic, acrylonitrile, pyrene, lead, ethylene oxide, epichlorohydrin, vinyl chloride, polychlorinated dibenzofurans, coronene, and polychlorinated dibenzodioxins.

The Toxic Air Monitoring System located at 1262 Mae Drive which is south of Interstate 10 and east of Loop 610, measured benzene, cumene, ethylbenzene, perchloroethylene, styrene, toluene, 1,1,1-trichloroethaue, 1,3,5-trichlorobenzene, trichloroethylene, m/p-xylene and o-xylene. Benzene, toluene, and m/p-xylene were found in higher concentrations than in cities of similar size and industry mix.

1012336

005379

Although the above data are not composite numbers for VOC concentrations, several observations can be made. First, the Houston ambient concentrations of benzene and toluene are high which contribute to VOC readings compared to other coastal cities of similar population and industry mix (i.e., Boston and Chicago). Second, Harris County is a non-attainment area for ozone which means that ozone concentrations have exceeded 0.12 ppm at least twice over the past year. High ozone levels may be caused by nitrogen oxides (NO_x) and/or volatile organic hydrocarbons (VOC's). In summary, what is known from the above information is that there are high concentrations of VOC's in the Houston area; however the impact of the North Calvalcade Site on the air quality and the ambient concentration of VOC in Houston can only be determined by monitoring.

We will continue to evaluate existing data and will advise Mr. Pendergast if further information is discovered. Please contact Julie Cadogan (X-7208) if you have questions.

005380

005380

Gulf Coast Community Exposure Study
Cloverleaf 2
(rglu[3])

Table 1

Sample Date	CRY	PY	B(a)P	BZ	B(g)P
1/6/86	2.00	7.00	ND	ND	ND
1/11/86	NS	NS	NS	NS	NS
1/28/86	ND	ND	ND	ND	ND
2/5/86	ND	ND	ND	ND	ND
2/14/86	NS	NS	NS	NS	NS
2/18/86	ND	7.6	ND	1,300	ND
2/24/86	ND	9.8	ND	2,760	ND
3/9/87	ND	ND	ND	1,217	ND
3/17/86	ND	41	ND	1,000	ND
3/29/86	ND	107.0	10.5	30,100	ND
4/8/86	ND	5.5	1.0	1,700	2.5
4/19/86	20	3.5	2.0	NS	1.7
4/27/86	ND	8.7	ND	8,500	ND
5/6/86	6.0	4.8	ND	7,400	0.7
5/17/86	57.9	15.1	24.0	27,900	6.86
5/24/86	13.6	2.4	1.4	12,600	1.2
6/4/86	1.55	9.34	ND	18,700	ND
6/10/86	ND	1.07	ND	22,700	ND
6/20/86	1.2	9.4	ND	17,800	ND
7/6/86	24.0	0.75	28.6	16,000	33.0
7/16/86	0.37	1.79	ND	9,000	2.57
7/25/86	7.7	4.2	7.2	5,000	2.7
8/7/86	0.47	5.60	0.37	15,000	0.15
8/14/86	ND	ND	ND	8,900	ND
8/28/86	3.70	15.7	7.64	4,500	7.90
8/30/86	25.2	29.0	19.0	3,800	1.28
9/7/86	8.4	7.5	1.3	400	0.40
9/16/86	ND	3.7	ND	17,800	ND

All values are reported in nanograms per cubic meter (ng/m[3])

Abbreviations used in the data are listed below:

CRY = chrysene
PY = pyrene
B(a)P = benzo-a-pyrene
BZ = benzene
B(g)P = benzo(ghi)perylene

NS = no sample
ND = not detected

Other chemicals tested for but not detected over the duration of the study:

Arsenic
Pyrene
Ethylene Oxide
Vinyl Chloride
Coronene
Acrylonitrile
Lead
Epichlorohydrin
Polychlorinated Dibenzofurans
Polychlorinated Dibenzodioxins

005381

005381

005382

Toxic Air Monitoring Study
Houston
(ppbv)

Table 2

Compound	Jul-Sep 1985			Oct-Dec 1985			Jan-March 1986			Apr-Jun 1986		
	Num	Avg	Max	Num	Avg	Max	Num	Avg	Max	Num	Avg	Max
Benzene	7	1.80	2.98	6	2.56	4.87	2	2.40	2.48	3	1.61	2.16
Cumene	4	0.08	0.10	4	0.06	0.10	9	0.73	0.13	3	0.03	0.04
Ethylbenzene	8	0.61	1.07	8	1.44	3.40	13	0.58	1.46	8	0.33	0.56
Perchloroethylene	10	0.20	0.29	6	0.39	0.94	6	0.13	0.17	2	0.10	0.10
Styrene	7	0.38	0.71	4	0.46	0.95	5	0.43	0.57			
Toluene	6	2.37	3.76	8	5.78	10.16	12	4.07	9.56	9	2.21	3.85
1,1,1-Trichloroethane				4	0.71	1.12	2	0.38	0.50			
1,3,5- Trichlorobenzene				2	0.34	0.58	3	0.38	0.64			
Trichloroethylene												
m/p-Xylene	8	1.43	3.81	7	2.38	5.32	9	1.64	2.96	6	1.22	1.89
o-Xylene	11	0.71	1.49	9	0.93	1.88	11	0.74	1.84	7	0.41	0.72